The Manitoba School

A Magazine for Classroom Service

Vol. 1—No. 2 OCTOBER, 1930 $2.00 a Year

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Published Monthly (except July and August) by

INSTITUTE OF APPLIED ART, LTD.

Educational Publishers

116 STRAND BUILDING BRANDON, MANITOBA

The Manitoba School

A Magazine for Classroom Service

Vol. 1 October, 1930 No. 2

EDITORIAL

WASTE LABOR IN EDUCATION

We live in an age of labor-saving devices, when the performance of useless operations is regarded as uneconomic and as an evidence of faulty organization. In education, however, this modern movement has made very little headway. There are still to be found teachers who assign their pupils tasks which are not given for their educational value, but merely to keep them busy. Perhaps the pronunciation or meaning of a word is asked, which the teacher could answer in a moment, yet the child is told to find it for himself in the dictionary. Tasks are set for reports on topics from reference books which the teacher could well make clear with no trouble to himself or labor on the part of the pupil. It is the extension into schoolroom practice of the theory in poultry yard practice that you must throw the feed into the straw to "make 'em scratch for it."

The same theories are held in some quarters in relation to a teacher's work. He is expected to be browsing continually for his class materials from texts and references which were never written with his problems in view. The amount of preparation required for each day's work by the average public school teacher is not generally realized. The fact that he must have his plans ready to teach effectively every subject of eight grades, and supply new devices to enliven his work, is sufficient to suggest that the teacher's task is one of considerable magnitude.

To supply helps which will be of assistance to the teacher in the daily work of the classroom is surely legitimate. Rather than have five thousand teachers making a study of the same material or preparing sets of exercises for their classes, one teacher could do all the work with the facilities of the best reference books at his convenience, leaving the others freedom to give more of their time to the immediate problems of the classroom and to community activities. It is assistance of this kind that this school magazine aims to provide, and we are convinced from the numerous letters of appreciation, which we have received from teachers, that it supplies a real need.

BOOK REVIEW

"VISUAL EDUCATION": A Comparative Study of Motion Pictures and Other Methods of Instruction (Frank N. Freeman), The University of Chicago Press, Chicago, Illinois. 1924, 388 p.

* * *

In Chapters I, II and III, the author gives a general summary of the study, which was concerned mainly with the use of slides, stereographs and motion pictures. In the various comparisons of method, the content of the subject matter was kept constant, and the form in which it was presented varied. The study dealt chiefly with films designed to give information or to teach how to perform an activity. The visual materials used were selected as the best available. Care was taken in constructing tests to favor no single method of presentation. Tests of immediate reproduction and of retention were used.

In Chapters I to XII, of Part II, detailed reports of individual investigations concerning methods in various subjects are given.

Summary of Findings.

1. The relative effectiveness of verbal and visual instruction varies. Pictures may not be substituted for language. Pictures are most useful in giving new contacts with the material world. If children have had adequate concrete experience, verbal instruction is superior to visual in organizing and integrating it.

   Motion pictures should furnish otherwise inaccessible raw material of instruction, but should leave the organization of the complete teaching unit largely to the teacher.

2. Although exceptions were found, comparisons indicated that informational motion picture films are not superior to slides, still pictures or stereographs accompanied by the usual comments. The understanding of the action of an object may require that it be shown in motion. The still picture permits analysis.

3. In teaching science, demonstration by the teacher is superior to the motion picture.

4. In teaching how to do or make something, demonstration proved superior to the film, but the latter was superior to the slide and stereograph.

5. Modern methods of instruction were as effective as the

film in securing interest and in formulating activity of pupils.

6. Motion pictures are apparently best in exhibiting moving objects and in aiding analysis of motion.
7. A motion picture film is more effective when accompanied by carefully prepared oral comment.
8. It is uneconomical to put into motion pictures actions which can readily be demonstrated by the teacher.
9. It is desirable to have motion picture films in small units.
10. Films may easily encourage an attitude of passive receptivity. The pupil must have an active part in the educative process.

"VISUAL INSTRUCTION IN THE PUBLIC SCHOOLS." Anna V. Darris. (Ginn & Co.) 1928, $2.50.

* * *

This book appears to the reviewer to be written by an enthusiastic user of visual aids. It stands in contrast to Freeman's book reviewed above. Instead of the careful, considered statements of the latter book, we have sweeping statements that appear to be generalizations from the writer's experience. In this text we are given advantages but not disadvantages. The author assumes without comment what the more scientific writer would surround with interrogation marks.

In spite of this outstanding defect, the book is very helpful to the teacher who is wondering how to use visual aids most effectively. Excursions, photographs, exhibits, specimens, models, pictorial charts, maps, globes, stereographs, lantern slides, still films and motion pictures are discussed in turn. Practical suggestions are given throughout concerning how and when to use each.

In Part II of the book, the author, after discussing how visual instruction may be made a part of the problem lesson, the project, the drill lesson or the lesson for appreciation, applies her theories and techniques to the teaching of geography, history, civics, nature study, general science, the fine arts, the household and manual arts, and health education.

In Appendix "A" is given a list of sources of supply for various illustrative materials. There are twenty pages of addresses and prices for specific aids. In Appendix "B" there are twenty-four pages of classified aids for specific subjects and topics of the curriculum. This appendix will be mort helpful to a teacher in the United States than to any other. The body of the text is full of suggestions for the teacher of intermediate and senior elementary grades.

"HOW TO TEACH GENERAL SCIENCE."

By J. O. Frank. (P. Blakeston's Son & Co., 1012 Walnut Street, Philadelphia.) 1926, 235 p.

* * *

This is a splendid book for the teacher of general science. Its practical nature impresses the reader, while filled with suggestions that may be used every day, it is thoroughly up-to-date in its theory.

In reviewing early secondary education in the United States and the place of science teaching therein, the author traces the change from bookish science with the emphasis upon facts, classifications and formulas, to the present environmental content with the emphasis upon scientific attitudes and methods.

General science has a unity of its own. It is organized as the last science subject to be studied by all pupils who drop out of high school at the end of their ninth year of schooling.

Different methods of teaching general science are evaluated and the merits of the lecture demonstration stressed. The place of the project and of individual experimentation are made clear.

There is a good discussion of efficient classroom techniques, methods of development, questioning and assignment-giving are outlined. Methods of testing results and sources of test materials are detailed, special problems on motivation, class grouping, extra curricular activities in science and use of supplementary materials are considered.

In Chapter XVI are six pages of bibliography, books and journals, useful in teaching the subject. The book closes with a forty-page list of special teaching aids for which materials, publishing house addresses and prices are given.

No teachers can afford to teach general science without the general view given by a book such as this one.

CURRENT TENDENCIES IN THE SELECTION OF CONTENT AND IN THE METHODOLOGY OF SECONDARY SCHOOL SUBJECTS

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High School Science

Last month's article gave the seven general objectives of secondary education. Of these seven, all but "command of the fundamental processes" may be realized by high school science. Health conservation is related to the topics "control and elimination of disease," "public health," "personal hygiene," and "sanitation." Physiology, general science and biology will be the main avenues of approach to these values. Biology, physics, chemistry and general science further "worthy home membership." The exploratory science of the junior high school aids in vocational guidance, while both general science and the special sciences give training for specific vocations. Citizenship is improved when the voter who controls expenditures duly appreciates many of the problems of science, when he has respect for scientific methods of investigation, and when he can distinguish between the scientific expert and the persuasive meddler. Science training gives the student many avocational interests. Hobbies in electricity, in engineering, and in horticulture are typical of these. The study of cause and effect, of biological laws, and of the nature of the physical and chemical world share with other subjects in the development of ethical character. The possible relation of science to these aims has determined the content and the method of instruction advocated today.

Science should be so organized and taught that the pupils acquire new methods of solving problems, interest in the every-day applications of science, habits of scientific analysis, and cultural values from an understanding of society's command over scientific principles.

Principles Governing Selection and Presentation of Subject Matter.

Purpose.—The purpose of high school science is not to load the pupil with information. Memorized subject matter is often not understood. Even if understood it encourages passive reaction in the learner. The discussion of aims gives a statement of what the science course should give the

pupil. The course given in any year of the high school should serve the needs of all the pupils of that year. It must not neglect those students who will drop out of school at the end of the year.

Method.—Whatever method is followed, it must begin with and encourage the self-activity of the pupil. The content should be interesting, and the entire study of the subject should be purposeful for the student, that is, he should find answers to real questions which have perplexed him.

Science instruction generally begins with subject matter from the local environment of the pupil. It begins with the partially familiar in which are many as yet unanswered questions. It is subject matter common to the entire student body. There is a community of interest and knowledge with which to begin class work. Because pupils will advance at different rates, it is sometimes stated that the content should contain three types of material; (a) the minimum essentials, to be mastered by all; (b) the near-essentials for the average group; and (c) the local supplementary material for the brightest pupils.

It is generally agreed that in the early stages of science instruction there should be unified topics for study, and that these should draw upon all the various special sciences. By following this plan of organization, the pupil is led early to see the unity and meaning of science studies.

Although there is this measure of agreement in the matter of general organization, there is less unanimity of opinion respecting the particular methods that are to be followed in the classroom. It is agreed that somehow pupils must be trained in constructive work, in experimental procedures and techniques, in interpreting experimental findings, in using supplementary source materials, in discussion, in compiling and presenting reports, etc. The relative importance attached to each of these items varies from instructor to instructor. It is inevitable then that in one school laboratory work is stressed, in a second projects are in favor, in a third class demonstrations are the rule, while in others the recitation method supplemented by supervised laboratory exercises is the common practice. The laboratory method makes use of routinized procedures, verification of laws, standardized instructions and note-making by the pupils. Those who favor the project method place little emphasis upon homogeneity of classes upon extensive outlines, and upon routine, valuing rather the intensive, purposeful exploration and study of pupils who are individually interested in definite problems of their own. The teacher who uses the class demonstration method may point out that time is economized, that fewer materials are necessary, that the randomness of individual experimentation is avoided,

that all pupils are trained in the technique of handling and devising apparatus, and that administration is much simpler when entire classes are kept together in their progress through a subject. In the school where the older recitation method is adhered to, one may be informed that experimental procedures restrict the amount of work that may be covered in a year, that in the majority of instances the experimenter is either verifying data on the instruction sheet or repeating experiments fully described in the text, that students seldom put questions to Nature and then start in search of answers, that factory methods characterize the laboratory, and that note-making enslaves if it is not demoralizing to the student.

The teacher in Manitoba is likely to decide on a method after worrying over certain administrative difficulties. He may favor the problem-solving method of science instruction, he may see great possibilities in the elaboration of projects, but he hesitates to adopt a method that does not lead rapidly to measurable results, that departs from the organization of a prescribed text, that is time-consuming and that does not prepare for examinations that place a premium upon information. Whatever method is followed, one hopes that at the end of the year's work pupils will know, appreciate, understand and be able to apply the few generalizations around which the year's work was woven. One fears that too frequently pupils see several topics without seeing their inter-relations. The pupil who closes his physical science text at the end of the course without seeing the unity of principle in the topics specific gravity, buoyancy, ventilation, air currents, surface ice, sedimentation, cream separating, etc., has missed the major values which the course was designed to give.

There is little doubt that the individual problem-method of teaching science is the one that gives permanent values. Progress is slow in the beginning, but the final results are more to be valued than those that accompany mass methods of instruction.

Science Sequences Recommended

For high schools such as we have in this Province, the generally approved sequences of science courses is as follows:

First year: general science including hygiene.
Second year: biological science including hygiene.
Third year: physical science.
Fourth year: chemistry.

This sequence has, among others, the following points in its favor:

(a) It gives to the one-, two- or three-year student a total course that is complete in itself and one that can function in later life;

(b) It introduces first those courses which have the greatest number of life contacts;

(c) It avoids specialization until the tenth school year;

(d) It leaves chemistry, the most abstract of the high school science subjects, until the final year.

Teaching General Science.

Purpose.—It may be emphatically stated that the emphasis in general science is not upon memorization of facts. The text-book recitation will not give the results desired from the study of the subject. The stated aims are: development of intelligent observation; influence on pupil habits; training in the organization, classification, presentation, and interpretation of data; discovery of interest in any of the special sciences.

Grade Placement of Course.—In the ordinary high school, general science is a Grade IX subject. If a junior high school is a true part of the secondary school, the tendency is for the general science to be given in Grades VII and VIII, though for fewer periods each week. By lengthening the time during which the subject is taught, the various topics may be introduced more nearly at the time when natural interests in them are awakening.

Selection of Subject Matter.—The tendency is to select the subject from the immediate environment of the pupil. Th concrete and partially familiar should lead to many new and untried experiences. Continuity is obtained by dealing with all the phenomena relating to a given topic without regard to its relation to any of the special sciences. Any phase of a special science which can contribute to the development of the unit is used. The text-book may give suggestions and outline minimum essentials in a course but it cannot detail courses suitable for different localities, where farming, mining, fishing, and urban activities are found.

Method.—One main point of emphasis running throughout the literature on the subject is that there should be much individual instruction. All pupils should not be required to delve into the same problems whether interested in them or not. Another point on which there is much agreement is that there shoull be much pupil-activity. If health habits are to result, pupils must practice these habits. If they are to be trained in drawing correct conclusions on the basis of observed facts, they must have practice in observing facts, in recording, tabulating, and summarizing them, and in

evaluating findings. Scientific methods of thinking result from practice in this manner of thinking. The routine recommended is as follows:

(a) Begin with a fundamental law or principle in a practical situation;

(b) Investigate, observe the fundamental facts that relate to principle;

(c) Select the pertinent facts and arrange in order of importance;

(d) Isolate and define the principle;

(e) Apply the principle to other practical situations.

There are various ways in which the above routine might be carried through. Should the lecture-demonstration method be followed? Should a uniform set of laboratory exercise be worked? Should the pupils be permitted to work individual projects? If the project route is followed, how many projects should be attempted in any one year? Pupils must gain in understanding. They must not work by rule, fitting figures into blank spaces in formulas.

If the individual problem-solving or project methods are not followed, it is mainly because time is limited and because a prescribed amount of subject matter is to be learned. It is generally agreed that these methods teach self-reliance, develop initiative and resourcefulness, develop reasoning ability, and meet individual difficulties more naturally.

Pupils should keep note-books. Notes must not be dictated and committed to memory. The note-book carries a record of all observations made. Training in its correct use can result only if the notes are made in the laboratory or on the field excursion at the time observations are being made. Tables, computations, conclusions, and suggestions should all appear as part of the pupils' written record.

If pupils are to acquire correct attitudes toward the subject, a single text-book is wholly inadequate as a reference book. There should be several text-books, reference books, journals, collections, etc.

Lesson Procedure.—The following teaching technique is recommended:

Step 1: Exploration.—In this first lesson, the teacher uses oral questioning, written quizzes, class discussion to determine what basis the class has for the instruction that is to follow; with this information, the instruction knows both what to teach and what not to teach. One discovers also the special interests of the pupils and these may be used later when giving or suggesting assignments.

Step 2: Presentation.—During these lesson periods, or this lesson period, the teacher gives the pupils a general bird's-eye view of the topic, its range, its significance, its historical importance, etc. In these periods the pupils' interest is aroused. From their environment and experience many related problems are raised. The pupils know what they are to study about, they have sufficient understanding of the principle under discussion to go on to attack the many related problems that have been suggested. The student is orientated in the new material.

Step 3: Assimilation.—In this stage the pupil masters the topic. He gains the knowledge, the skill, etc., the subject is designed to give. Each student pushes the study of the topic beyond the limits set in the presentation period, Step 2. It is here that the pupil will experiment, in an attempt to answer a few questions that were most interesting to him. Home study and supplementary reading are in place here. The teacher must give references for various topics, must have definite references ready for instant use, and must be a general supervisor of student activities.

Step 4: Organization.—At this stage the facts and data gathered in Step 3 are sorted, tabulated, compared and evaluated. The new subject matter is related to the old; a new apperceptive basis is laid; the pupils prepare reports, present them to the class, discuss them, draw blackboard outlines and diagrams, and in every way possible pool and co-ordinate the findings of the individual members of the class.

Step 5: Application.—Now the pupils use their new ability in interpreting and solving additional problems. Here is the test of the learning. The pupil proves his mastery of the new unit by illustrating the new principle with applications which he has selected from his environment. The list of questions given for discussion in the prescribed text would be taken at this point in the lesson. If the pupils have mastered the lesson unit they should see and be able to explain the application of the new context to each of the questions suggested.

Step 6: Testing.—This is the teacher's task. By informal tests, an attempt is made to measure the degree to which pupils have mastered the principles taught. If the tests are diagnostic, they may be made the basis for remedial instruction.

Step 7: Re-teaching.—Pupils who have not mastered the unit tested must be re-taught. Other pupils may proceed with advanced supplementary work on the same unit.

Tests.—Following are a few types of test in general science. They are not designed to parallel any one text-

book or course. From studying them, one may learn what principles and facts are considered important by the designers of the tests.

1. General Science Tests (Dvorak), Public School Pub. Co., Bloomington, Illinois.
2. General Science Tests (S. R. Powers), Bureau of Publications, Teachers' College. ($2.00 per 100.)
3. General Science Tests (Reech-Poponoe), World Book Co. (Highly recommended. Part I, 25 tests for $1.25; Part II, 25 tests for $1.50.)
4. Toops' General Science Test (H. F. Toops), Institute of Research, Columbia Univ., New York.
5. Wisconsin General Science Tests (Giles, Schmidt & Osburn). Eau Claire Book and Stat. Co., Eau Claire, Wis. (Set, 30c., 1100 questions covering 11 units.)

Method Applied to the Unit "Water and Its Uses"

Unit: Water and Its Uses. Sub-unit or topic: Water, Ice and Steam.

Preparation for Step 1.

1. Decides that while studying this topic, pupils will master the following principles: (a) There are substances, water for example, that take any one of three forms according to conditions of temperature, pressure and volume prevailing. (b) Fix certain conditions and these critical points occur at fixed temperatures, vary the conditions and temperatures change to new fixed points. (c) Temperature remains constant at critical points during change of state, but certain energy (heat) changes are then taking place.

2. Recalls applications of these principles. Decides upon some as sufficiently simple to be understood by pupils of this age.

3. Arranges tentative list of such applications upon which class discussion will focus.

4. Prepares a few exploratory questions.

Lesson 1. Topic raised for discussion. Present status of class determined. Interest aroused. Pupils classified mentally according to their present knowledge of topic.

Preparation for Step 2.

Prepares for a class demonstration in which by typical experiments, necessary diagrams, blackboard work, etc., each principle is illustrated simply. Beginning with ice, the three forms of water will be obtained by varying temperatures only. Repeat varying pressure. Note approximate relative volumes of the water in each of the three states.

Repeat experiments with saline solution. Prove that it takes heat to change ice to water even when temperature is constant. Determine if heat is taken in or given off when water changes to steam.

State all findings in clear, concise English. Be sure the class demonstration and the principles deduced are understood by all members of the class.

This Lesson 2 may in reality take several class periods. Before leaving this stage of the development of the topic, in fact, throughout Lesson 2, pupils are asking questions: "Would this happen—?" "Would that happen—?" "Why is it that—?"

Preparation for Step 3.

The preparation at this stage is two-fold. Part of it consists in eliciting many questions and problems from the pupils. In part it consists of preparing lists of references for various pupils and various problems. Different pupils will be interested in different queries. They will require different references. They will be confronted by different experiments. The teacher must be ready to suggest materials and guide experimentation during Step 3 outlined above.

Step 4.

After the necessary periods on Step 3, the class comes together for a group discussion and for organization of all data obtained. A fuller understanding of the principles will result.

Step 5.

In applying the new subject matter in Step 5, the various questions asked in Section 130 will be considered as will also any points covered in the text in Sections 131 to 145 inclusive. A tabulation of the material covers approximately twenty applications. The student who has mastered the topic will see the continuity and unity of the entire text discussion. The applications included in the text cover the following:

1. Volumes of solid, liquid and gaseous equivalents.
2. Critical temperatures, including thermometers.
3. Varying cooling points with varying air pressures.
4. Gradual changes of state—evaporation, perspiration, artificial freezing.
5. Changing critical points for solutions of different solids —ice cream freezing, etc.
6. Energy changes accompanying changes of state—refrigeration, fevers, beach temperatures, etc.

A real test would not call for memorization and reproduction of this text material, but for the solution of a few additional applications of the principles taught. The pupils

should be required to memorize well-worded statements of the laws considered, but this memorization should come after an understanding has been gained.

The writer does not argue that this individual procedure can be followed. Nevertheless, this is the recommended course. The experienced teacher will follow a method intermediate between the text-book recitation, the rigid laboratory course with fixed lists of experiments, and the individual project method.

(Next month's article will deal briefly with the physical, chemical, and biological sciences.)

ARITHMETIC

M. E. Lazerte, Ph.D.

GRADE I

[Editor's Note.—This year's outline in Grade I will follow the same sequence as that found in "Primary Number Booklet, Grade I." The classes using these booklets will have an advantage over others. The "Primary Number Booklet, Grade I" above referred to may be obtained from the publishers of this magazine. Price 25 cents.]

Last month's outline provided for varied experience in number, but it did not ask for memory work. It must not be assumed that all the content prescribed for September will be mastered in one month. Children must live and re-live experiences. Each repetition of the experience adds new meaning and helps in the development of number concepts.

The emphasis last month was upon the first five steps on the number system. This month the series may be extended to cover the first ten numbers. In counting there should be such familiarity with this series that the following exercises and questions may be completed or answered rapidly with assurance.

1. Count from one to ten.
2. Count from ten to one.
3. Count from six to ten.
4. Count from ten to six.
5. What number comes after 5? after 9? after 4? after 3? after 6? after 1? after 7?, etc.
6. What number comes just before 5? before 10? before 4? before 6? before 9? before 3? etc.

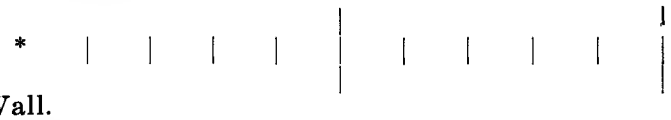
If pupils are to answer all the above questions readily, they must be **thoroughly** familiar with the counting series. The basis for later successful work is laid here in perfect familiarity with the number series from one to ten.

In Exercises 9, 16 and 17, on page 16 of last month's outline, this familiarity with the series was stressed.

Continue Exercises 9 and 17, and co-ordinate with them much language work. Have one pupil stand at position five, another at ten. Pupils may be expected to use these two pivotal points thus marked as a guide in answering questions similar to the following: How many steps is it from 5 to 10? from 0 to 5? from 1 to 5? from 5 to 6? from 5 to 9? from 3 to 5? etc. What position is 2 less than 5? 2 less than 10? 5 less than 10? 1 less than 5? 1 less than 10? Which is the greater, the distance from 5 to 7 or the distance from 7 to 10? Which is greater, the distance from 3 to 5 or the distance from 5 to 7?

It is assumed that where the above exercises are being

worked through that the number scale is marked on the floor as follows:



* Wall.

Each unit position is indicated by chalk mark or otherwise and the 5 and 10 positions are peculiarly indicated by longer lines or by having pupils stand at these positions. Keep the symbols from the pupils at this stage. The difficulty of the exercise is greater when the symbols are not presented. This is evident. If the positions are marked by symbols the pupils are relieved of much of the thinking otherwise necessary. The teacher who follows this outline may agree by the end of the month that there is much number work demanding concentration and real quantitative thinking without rushing into the direct memorization of meaningless facts and useless manipulation of symbols.

The work outlined above may be thrown into a new setting by using the bead frame referred to in Exercise 16, page 16 of the September outline. Select the particular exercises that fit the device most readily. The bead frame may be used daily to give practice in simple groups. With five red beads and five blue on the line the pupil readily learns to move across the frame the groups 5, 10, 4, 3, 7, 9 ,etc. This exercise may be varied and made more difficult by asking for 2 more than 5, 1 less than 10, 1 less than 5, 2 less than 10, etc.

If the bead frame is not available. each pupil may be asked to draw ten circles as follows:

OOOOO OOOOO

coloring the first five red and the last group blue or some other color. Each pupil may use a button or other marker and place it in the required position in answer to questions asked.

It should be emphasized that throughout the exercises each pupil is doing the job. Each is provided with the apparatus for work and seated at his own desk he performs the work demanded while the teacher supervises and notes each error as it appears.

Teachers who are using the primary number booklets should use the number chart on the front cover page as the basis for many of these early exercises.

The Even and Odd Numbers

Coming back to the line marked along the floor, pupils should grasp easily the meaning of the "even" and "odd" numbers. Let the pupil stand at 0 and take double rather

than single steps. He will thus arrive at 2, 4, 6, 8, 10. Retracing his path he will reach 10, 8, 6, 4, 2. Beginning at 1 and repeating the same exercises he will have 1, 3, 5, 7, 9, and its reverse 9, 7, 5, 3, 1. On the bead frame the groups 2, 4, 6, 8 and 10 or 10, 8, 6, 4 and 2 may be reviewed in succession. Proceed similarly with the odd numbers. On the colored number chart on the primary number booklet five markers may be placed and their positions read. These same booklets provide drill in writing the odd and even series.

The Number Chart

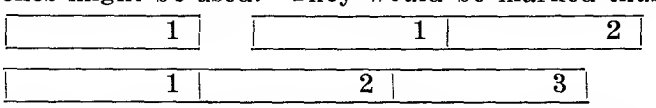
In addition to the individual exercises outlined above much group work may be taken from the shart if a large one is hung on the wall. Ask a pupil to place the pointer on the number called. Rather than place the pointer on, say position five, teach him to draw the path of the curve around the entire group five. First pupil places a counter at five, a second pupil is asked to show the class "two more than five," etc.

The Group "Ten"

Most of the devices we are using have ten as a suggested base. This is quite intentional. Unconsciously the pupil builds his number concepts around this base 10 with its sub-base 5. The teacher should be conscious of this purpose as the work proceeds. Less artificial than the number chart is money. Again the base 10 enters. If the teacher can procure imitation coins, make suitable substitutes, or use real money without creating other problems for herself, many exercises may be repeated with the coins. A dime, two five-cent pieces and ten one-cent pieces would be required for each pupil. Buying and selling situations may be created in which the pupils will learn much concerning the meaning of number. The money problems are more valuable later in the year when the pupils are learning combinations and separations.

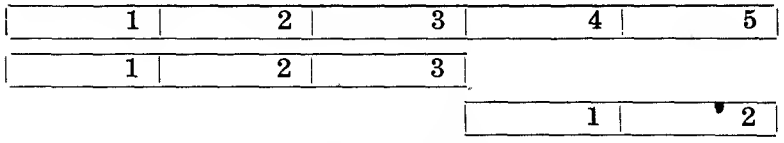
Measurement

The cardboard ruler marked only in inches may be used. Rather than use a single 12-inch ruler, the writer would limit the length to 10 inches and prevent later confusion with the foot rule by having a series of these paper rulers for each pupil. Rulers of various lengths from one inch to ten inches might be used. They would be marked thus:



Many exercises will suggest themselves to the resourceful teacher. By how much is the five-inch ruler longer than the three-inch ruler? Pupils will learn that there is a main reference point on each ruler, namely, the zero end.

In making comparisons these reference points must coincide, that is, the rulers must each have their zero end at the same point. Rather than have the pupil count the inches in the difference it would be preferable to train him to place the proper ruler in the difference-length and thus read directly the desired difference.



Language Training

If we remember that the language of arithmetic must be taught throughout the year, we will vary our language from time to time. The majority of language meanings are caught, not taught. We must avoid stereotyped language forms. Prepare the child for thinking quantitatively by giving him a language with which he can interpret or express ideas. It is the writer's opinion that the thoughtful teacher does not need, and is insulted if given, a cut-and-dried outline of work in which every step is prescribed. It is our business to determine and arrange in order of difficulty the main ideas to be mastered, and then to use the materials and situations of the classroom as the setting for the work.

Combinations and Separations

In this outline no fixed work in combinations and separations is given in these first two months. If the class is ready for such work, it may be given incidentally. Surely the pupil who has had the varied experiences outlined heretofore may be expected to have little difficulty in learning that 5 and 2 are 7, or that 1 less than 10 is 9.

The difficulty of a number fact depends upon the previous experience of the pupil. There are those who attempt to arrange the combinations and separations in order of difficulty. This attempt is largely futile. The relative difficulty of the combinations and separations depends upon the method of teaching followed. The outline to be followed this year presents the facts in a sequence that fits in quite naturally with the governing principle guiding the work. Five and four should be mastered easily. Four and three will be more difficult. A number relation is not necessarily difficult because it involves a relatively large number.

Oral Problems

Oral problems will be given every day. In fact every oral question presents a problem. Language training is given most naturally in problem setting. Probably the real incentive to learning the combination and separation facts comes from this early problem solving. Extend the list of

problems given on page 19 of last month's issue. Conduct a few lessons by giving problems one at a time, and allowing each pupil to really solve the problem by using the number scale, the inch ruler or the number chart. An article costs eight cents. I give the storekeeper ten cents. How much change should I receive? A pupil who knows thoroughly the number sequence from one to ten can solve this problem. The main difficulties are language difficulties. Dramatize the situations if necessary. Build up true problem attitudes. Do not allow guessing. Insist upon verifications. Give problems that are not self-evident. Protect the pupil from the tendency to manipulate numbers. Build up habits of thinking. Encourage resourcesfulness. Be patient; encourage the slow. The pupil may not be able to write the symbols well. This does not prevent him from thinking through number situations. Do not expect speedy work at first. Real problems require thought.

PROBLEMS

1. Which is greater, 4 or 3? How much greater?
2. How many must I put with 3 to make 5? With 9 to make 10?
3. How far is it from 5 to 10?
4. John is 6 years old. How old will he be in 2 years?
5. Mary is 6 years old. In how many years will she be 10 years old?
6. How many pupils are there in a class if there are ____ boys and ____ girls?
7. One chocolate bar costs 5 cents. What will 2 bars cost?
8. An ice cream cone costs 5 cents. A candy stick costs 2 cents. How much do they both cost?
   (Use the series of rulers for such problems as these, placing the 5 and 2 end to end.)

In giving problems the teacher will pick those numbers that fit in with previous exercises.

Interest

Pupils will be happy and interested in their number work if the teacher has the correct attitude. Smiles, encouragement, variety and intelligent understanding must replace grumblings, discouragement, naggings and dry, meaningless routine.

Outline

First Week: Floor scale from 1 to 10. Oral problems.
Second Week: Number chart exercises. Oral problems.
Third Week: Exercises with paper rulers. Oral problems.
Fourth Week: Money situations. Dramatization of number situations. Oral problems.

The writer will be pleased to receive from teachers following this outline questions concerning their difficulties. Questions if received will be answered in the following issue.

SILENT READING

D. J. Dickie, Ph.D.

SILENT READING MUST BE TAUGHT

Teachers have, in the past, taken it for granted that if a pupil reads well orally he could also read well to himself. This does not follow. Oral and Silent reading are two quite different things. They have different purposes; the physical and mental processes involved are different. The habits and skills developed in good oral reading actually hinder the development of the habits and skills which are most effective in silent reading.

Differences Between Silent and Oral Reading

Silent and oral reading differ in purpose. The purpose of silent reading is to get the thought as accurately, as fully, and as rapidly as possible. The purpose of oral reading is articulation, the expression of thought already secured.

The physical and mental processes of oral and silent reading are different. Reading is by eye-spans. The eye does not pass from one letter to the next, but sweeps along the line in a series of longer or shorter jumps or spans. At the end of each span it rests upon a fixation point. At the end of the line it returns in one long single sweep to the beginning of the next line. The reading is done while the eye rests on the fixation point. While fixed on the point, the eye sees clearly in a small circle, and vaguely in a large circle round the point. The outlines of words seen vaguely in the large circle hint to the mind the thought which is coming and starts recognition. The few letters seen clearly in the small circle verify the suggestions of the large circle, and enable the mind to complete its interpretation.

Processes Involved in Silent Reading

The good reader, therefore, is one whose eye sweeps along the line in long regular spans, making few fixations and resting for a very short time on each point. His mind is quick in picking up the clues presented to it in the circle of vague vision, and accurate in interpreting them. The poor reader, on the other hand, has an eye which makes very short spans. He makes many fixations in each line and his eye rests a long time on each point. The mind being slow and inefficient in picking up the clues from the circle of vague vision, the eye is forced to dwell on the point, making little backward sweeps, called regressions, hoping to pick up the meaning. The untrained eye hinders the mind in its part of the work; the inexperienced mind hinders the eye in its part.

Processes in Oral Reading

In oral reading, the eye spans are shorter, the fixation pauses longer, and the regressions more frequent than they are in silent reading. In reading aloud, the eye runs, or should run, well ahead of the voice. The mind grasps the thought before the voice arrives to give it expression. The distance between the ey and the voice is called the eye-voice span. It is long in good readers and short in poor readers. In silent reading the eye and the mind together sweep rapidly ahead; in oral reading they must wait for the voice, and this makes even the best oral reading slow; the fact that part of the attention is focussed on the articulation makes it also less effective than silent reading. It is plain that if children receive all their training in oral reading, they will form the habit of using a short eye-span, a long fixation, and many regressions. They will read silently only at the rate, and with the effectiveness of oral reading. This wastes time and effort.

Not to be Taught Together

Since oral and silent reading differ so greatly, it is impossible to teach them together. If you wish your pupils to become good oral readers, you must teach them how to read orally and give them practice in readong aloud. If you wish them to become efficient silent readers you must teach them how to read silently and give them practice in reading silently.

Begin Silent Reading in the First Grade

The concensus of modern opinion holds that silent reading should begin in the first grade. Brooks reports a successful experiment in which the pupils were not taught to read aloud till the second year. The National Committee on Education, together with most writers on the subject, advise that the reading time in Grade I should be divided evenly between oral and silent reading. Silent reading has, indeed, one important part to play in beginning reading. Perhaps the most vital point in the whole process of learning to read is that the child should realize that the words make a story. Children are frequently found, even in the middle grades, who have never grasped this, who think that saying the words is reading. To a child who has, from the beginning, been given silent reading practice, this is impossible.

SILENT READING PRACTICE FOR GRADE I

1. Action words or sentences on the blackboard to be read silently and the directions obeyed: Stand up; sit down; walk to the window; open the door.
2. The labels as: door, desk, chair, table, may be placed in a pile and the children allowed, each morning, to attach them to the proper object.

3. Matching strips with the nursery rhyme, or story charts.
4. Reading sentences from the blackboard and making the same sentences on their desks with their word cards.
5. Reading sentences which give directions to colour, draw, or make objects with plasticine or sand, and obeying the directions.
6. Place the names of the animal pictures in a pile and have the children place the name under the right picture.
7. After the chart rhymes and stories have been taught, cut them up and let the children practice arranging each rhyme in the right order.
8. Copy out the verses and stories taught on small pieces of cardboard. Cut these into strips and have the children arrange them in the right order.
9. Write on the blackboard very simple stories using the words the children know in new combinations. Have the children read them and answer questions about them.
10. Make on the blackboard small roughly sketched pictures of objects to illustrate the word cards. Have the children sort the word cards putting each under the proper picture.
11. When the phrase cards have been learned, cut each into two or three pieces and have the children put them together again.
12. Write on the blackboard sentences with blank spaces left in them. Have the children find the word card that fits into the space.

COMPOSITION AND LANGUAGE

A. J. Watson, B.A.

GRADE III

LESSON XXI

STORY FOR REPRODUCTION

Anna and the Kittens

Anna was a lovely white fluffy dog. Everybody loved and petted her until it seemed that she might be spoiled. The more you made of her the more she lapped your hand and "sat up" to show you how glad she was to have you notice her.

Anna's mistress lived on a farm where there were hens and cows and horses, and they all knew Anna and loved her. "Moo", said Betsy, the black and white cow, "Anna is my friend. I like her—moo."

"Cluck", said Mrs. Bertha Hen. "Anna is our friend, too. She plays tag with us but never pulls out our tail feathers."

Mr. Dobbin, the horse, heard them talking and called out, "She's my friend too. She often sleeps in my stall."

One day Anna's mistress brought home two kittens. "Ho-ho", said the rooster. "Anna will have a time of it now. I understand kittens do not like dogs."

"Cluck," said the hens, and "Moo," said the cow in doubtful tones.

For a whole week they didn't see Anna, but one day she came racing to them.

"Where have you been?" said the little red hen.

"How do you like the kittens?" asked Betsy.

"Do they scratch?" asked Dobbin.

"That's all nonsense," said Anna. "The poor things miss their mother and I am trying to take her place. I'll bring them to see you tomorrow and you must be on your best behaviour," and she ran off leaving them all with their mouths wide open.

Next day, sure enough, Anna brought them out, but everybody was so glad to see them and made such a noise that the two little kittens got frightened and ran off as quickly as their little legs would carry them.

"Gracious," said Anna, "See what you've done. You'll have to be more quiet. Now I must go and look after them. The kittens will have to be bathed before they take their

nap and it will take all my time to do it thoroughly. Good morning everybody."

"Good morning," they all said, much more quietly now, and they looked at each other with big question marks all over their faces.

"Well", said Mrs. Hen, "Did you ever?"

"No", said Mrs. Cow, "I never did."

Oral questions:

What kind of dog was this?

What was her name?

Where did she live?

What friends did she have? Imitate each.

What do you call the noise a horse makes? Try to imitate it.

Why did the hens, the horse, the cow, like Anna?

What do dogs usually do to these animals?

When the kittens came, why did Anna's friends think she wouldn't like it?

What did each say? How were they surprised?

Why was Anna good to the kittens?

What happened when she brought them to see her friends?

How did Anna take special care of them?

What did the cow mean by saying, "Did you ever?"

What did the hen mean by saying, "No, I never did."

Seatwork:

Write three sentences telling about Anna's friends, why they liked her, and how she cared for the kittens.

LESSON XXII

Fill in the blanks with either of these words: To, two.

1. The _____ girls went _____ town.
2. Would you like _____ play with the _____ boys?
3. The _____ birds in the tree began _____ sing.
4. The _____ boys have _____ books apiece.
5. They are not going _____ close the _____ schools.
6. Some boys do not like _____ walk _____ school.
7. She has _____ books in which _____ write her work.
8. Where do the _____ children like _____ go?

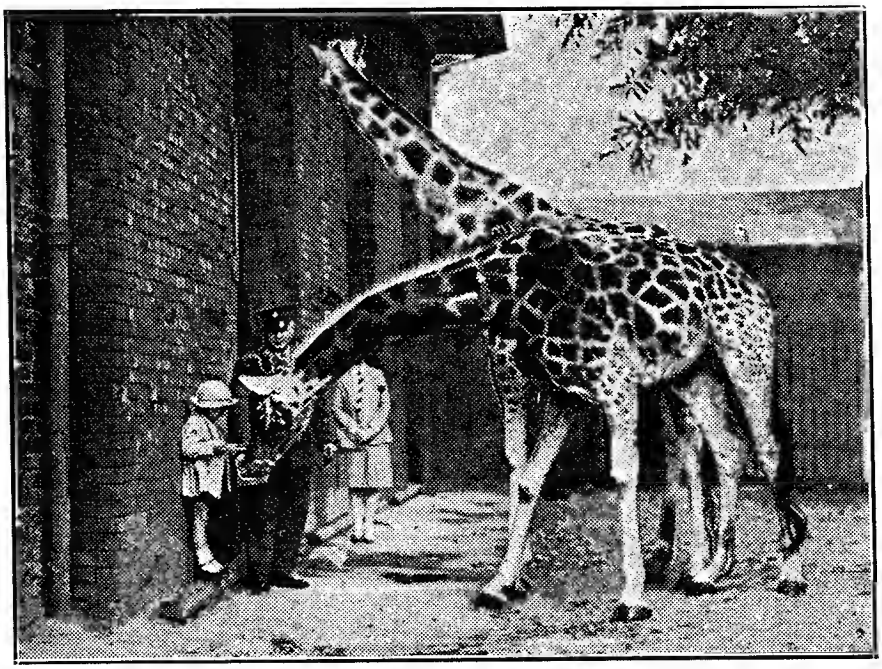
LESSON XXIII

PICTURE STUDY

Oral questions and discussion:

Name the animals; tell how many there are, why are their legs and necks so long?

Can you tell why they are marked as they are?



Where are these giraffes? How do you know?
What do we feed them?
What has the little boy in his dish or basket?
Where is his mother?
Who is the man? Why is he dressed as he is?
What is the other giraffe trying to do?
Do you think the little boy is frightened? Why not?
Name the picture.

Seatwork:

Write three sentences telling what a giraffe looks like, why his neck is so long, and what he eats.

LESSON XXIV

ORIGINAL STORY
The Aeroplane

Oral discussion:

Talk about what it looks like; where it goes; what it carries; what makes it go; what they call the man who guides; how he dresses; where and how the aeroplane starts; what different kinds there are; where they are kept; what stunts a good pilot often performs.

Seatwork:

Write a short story telling who guides the aeroplane, how he dresses, and where he goes on his trips.

LESSON XXV

Put in periods, question marks, and capitals.

(This is not a connected story, but put in this way to see if the pupils know when they come to the end of a sentence.)

peter's pet is a cat the trees ar big would you like to go to calgary tom and harry go to the big white school santa claus comes at christmas what do you like to play that is john on the swing mary can say dark brown is the river

golden is the sand
it flows along forever
with trees on either hand

LESSON XXVI

STORY FOR REPRODUCTION

Mr. Bunny Bob-Tail Moves

It was a fine spring morning and Mr. Bunny Bob-Tail, the rabbit, wished that a little change and excitement would come his way.

"H'm," he muttered, "It must be nice to have a new house now and then," and he looked at his own, shabby little home. Suddenly an idea struck him and he squeaked out loud as he usually does when an idea comes. "Why, what's to prevent us from finding a new rabbit hole and moving in right away?" So up he jumped and away he hopped to find one before he should get out of the notion. Soon he spied pust the very hole he wanted, well sheltered by bushes and—it was empty. "Well! If that isn't lucky," and with a skip and a hop off he went to tell Mrs. Bob-Tail and the four baby Bob-Tails that they must move right away. It didn't take them long though Bunny Bob-Tail had to run back at the very last minute for his tooth brush. When the hard work was finished they had a lovely supper of lettuce sandwiches and cabbage leaves. Soon everyone lay down and was fast asleep.

Now in the middle of the night a strange thing happened. A stout little rabbit hurried into the hole, jumped up on the bed and landed right on Bunny Bob-Tail himself. "Hi," shouted Bunny and "Hi" shouted the stranger. "How dare you give me a fright like that?" yelled Bunny.

"And how dare you give me a fright like that?" squealed the stranger.

"I only moved in here tonight," said Bunny.

"And I only returned home from my holidays tonight," replied the stranger.

"Do you mean to say you live here?" asked Bunny.

"Of course I do," said Mr. Stranger. "Good gracious! Did you think it was an empty hole?"

Then they both began to laugh and they laughed so loud that they wakened all the babies who were frightened and started to cry. The stranger was good natured and found another bed for the night. Next morning Bunny moved back to his old home and that was the last time he ever tried to move into somebody else's house.

Oral discussion:

Why was Bunny Bob-Tail so grumpy this spring morning?
What notion did he suddenly take?
What two things did he do?
Why did he like the new hole?
Who helped him to move?
How long did it take?
What did they have for supper?
What else do rabbits like?
Why did they all sleep so soundly?
What happened in the middle of the night?
Why was each surprised?
What mistake had Bunny made?
How did the stranger like it?
Why didn't he turn Bunny out right away?
What did Bunny do next morning?
What lesson had he learned?

Seatwork:

Write a short story telling why Bunny moved, what happened in the night and what lesson Bunny learned.

LESSON XXVII

Fill in the blanks with one of these words: to, too, two.

1. That boy is _____ thin.
2. Is it _____ far _____ go?
3. The greedy boy ate _____ much candy.
4. My pencil is _____ short.
5. Would you like _____ come _____?
6. The _____ girls have _____ far _____ go _____ school.
7. _____ miles is _____ far _____ walk.

LESSON XXVIII

PICTURE STUDY

What are these boys doing?
What have they on their heads?
Are they tied on? Why not?

Why are the boys not running?
Why are their heads so erect?
How many are in the race?
How may the race be lost?
How far do the boys have to go?
What is the man doing?
Who will win the race?
Give names to the picture and try this new game the first chance you get.

Seatwork:

Write three sentences telling the rules of the race, how far it is and what the winner must do.

LESSON XXIX

ORIGINAL STORY
The School Field Day

Oral discussion:

Talk about the different events Grade III may enter; about new stunts such as in the preceding picture; about practising for them.

Tell why you have field day; how you get into the different classes (i.e., by weight or age); what you wear; how many visitors you have; what the winners get; what refreshments you have.

Seatwork:

Write about your field day telling when you have it, what events you enter and what you have won at other times.

LESSON XXX

Write the word and the abbreviation for:

1. The day you like best.
2. The day we go to church.
3. The day on which your birthday comes this year.
4. The first school day of the week.
5. The last school day of the week.
6. The day that is Hallowe'en this year.
7. The word that tells how we buy silk at the store.
8. The very first part of your mother's name.
9. The very first part of your father's name.
10. The things you put in your shoes each morning.

LESSON XXXI

STORY FOR REPRODUCTION

Little Elephant Plays a Joke

Little Elephant smiled at pretty little Miss Zebra and said: "Mr. Humpy Camel and Miss Ostrich are coming to visit me today in the jungle. Won't you come too?"

Little Miss Zebra kicked up her heels and asked, "Is there nice tender grass in the jungle?"

"Of course there is," said Mr. Elephant. "You seem to have a lot to learn about the jungle yet. But here come our visitors." Then he started to laugh and he laughed so loud that he couldn't say "Good day" to them, and that was very bad manners. "Why are you laughing?" they asked.

"Oh it's nothing," said Mr. Elephant. "But every time I look at Humpy Camel the funnier it seems."

This offended Humpy and off he started for the jungle.

"Hey, what's your hurry?" cried Miss Zebra. "Let's find some water and have a drink first."

"Oh," said Humpy, "I had a drink day before yesterday and I won't want one till day after tomorrow."

This seemed very funny to the rest who didn't understand a camel's habits. So all the others went to the water hole and drank, but Humpy lay down on the bank and went to sleep. Suddenly a shower of water rained down on him thought the sun was shining. This seemed very strange for camels can always tell when it is going to rain. He opened his eyes and saw it was a very tiny little rain and it was falling only on him. He looked around quickly and found Mr. Elephant spraying him all over with water from his trunk. Then Little Elephant rolled on the grass, kicked

up his heels and laughed louder than ever, but Humpy only grumbled and mumbled for it was no joke to him.

"Why do you play such tricks on Humpy?" said Miss Ostrich, "He's a far smaller boy than you are and it's not fair."

"Oh," said Little Elephant as he rolled and laughed, "I can't help laughing at Humpy. He is all humps and bumps and mumbles and grumbles. He has two bumps on his back, two knees on each leg, and a bump on each knee. What could be funnier than that?"

"Nothing," said Humpy with a grin, "unless it is an elephant's trunk. I guess it is drinking so much that makes it grow so long."

And this time the joke was on Little Elephant.

Oral discussion:

What visitors did Little Elephant have this day?
What had they come to see?
How was Little Elephant very bad mannered?
What made him laugh so hard?
Why did the camel not want a drink?
How long can it go without water?
Why is this necessary?
How can an elephant carry water?
What can he do with it?
What joke did Little Elephant play on Humpy?
Why was Humpy surprised?
What did Little Elephant do then?
How was the joke turned on him?

Seatwork:

Write four sentences telling about the elephant's trunk, the camel's humps, the zebra's stripes, and the long legs and neck of the ostrich.

LESSON XXXII

Fill in the blanks with one of these words: there, their.

1. _____ mother is over _____.
2. Did you see _____ coats _____?
3. _____ hat were put _____.
4. _____ are no apples _____.
5. _____ dog ran away from _____ house.
6. _____ is a good picture in _____ readers.
7. Is _____ a table in _____ playhouse?

LESSON XXXIII

PICTURE STUDY

Oral discussion:

What kind of birds are these?
Where do we find them?

What are they most like in our country?
What are the young ones called? (signets).
What do we call young geese?
What is the mother swan trying to do?
What do the little ones think about it?
Why does she want to get them on the water?
Why has a swan such a long neck?
What kind of feet has it? Why?
What food do they get in the water?
What word is usually used to describe a swan?
Name the picture. Someone has called it "Out with Mother."

Seatwork:

Write three sentences telling about the swan's neck and feet, about coaxing the young ones into the water, and what she will get for them to eat.

LESSON XXXIV

ORIGINAL STORY

Autumn

Oral discussion:

Talk about its length (i.e., what months); the kind of weather; Indian Summer; changes in leaves; hunting ex-

peditions; cleaning up yards; bonfires; harvest time; getting ready for winter.

Seatwork:

Write a short story telling about three or four things that happen in Autumn or what you do at that time of the year.

LESSON XXXV

— A —

Writet the opposite word for: girl, man, queen, prince, aunt, mother, long, big, black, fast.

— B —

Change the word in black face to its opposite and make any other change that is needed.

Thus: As **black** as coal. Change to: As white as snow.

1. As **big** as a giant.
2. As **cold** as ice.
3. As **swift** as a deer.
4. As **long** as my arm.
5. As **pretty** as a rose.
6. As **sweet** as sugar.
7. As **hard** as a stone.
8. As **quick** as a squirrel.
9. As **heavy** as lead.

LESSON XXXVI

STORY FOR REPRODUCTION

Don Gets a Drink

Don is a little, light bay pony, with a white star on his forehead, and his right front foot, clear up to his knee, is white. Until he was eight years old his home was on a big ranch and his master used to irde him when herding the cattle. Don became so expert that he was considered the smartest pony on the ranch. He was always fat and sleek too because he knew all the nooks where the greenest and sweetest grass grew, and the coolest place to get a drink.

One day Don was brought into the corral and after much talking between his master and a stranger, Don was much surprised to see the stranger take the halter and start to lead him away. But Don had been taught to obey and after travelling a long way, the stranger turned him into a pasture with some other horses. Don felt lonesome and just couldn't make friends with the others, as they bit and kicked at him and wouldn't let him near the water trough till they were done. Sometimes they drank all the water and there wasn't any left for him. But Don wasn't an ordinary pony. He had watched his master turn a sort of handle near the trough and every time he did so the water came out of a long pipe. Soon his new master used to find the water turned on and he was puzzled as he didn't think a horse was smart enough to do it. So he hid and

watched one day when he knew the horses were thirsty. Suddenly he saw Don toss up his head, walk over and grab the handle with his teeth. Soon he had it turned and out rushed enough water for all the horses. This time they didn't chase Don away.

His new master was well pleased with Don't smartness, and took him into the barn where he gave him a nice feed of hay and oats. Then he put on the saddle and away they went and began chasing a white ball which the master hit with a mallet on the end of a long stick. This wasn't exactly like chasing cattle, but Don enjoyed the game and soon learned to follow the ball wherever it went. The stranger patted his neck to show that he was well pleased with him.

After this Don received special attention and soon became one of the best polo ponies in that part of the country, but it was all because he had received such good training on his old ranch home.

Oral discussion:

What did Don look like?
Where did he live when young?
What had he been trained to do?
In what other ways was he clever?
Why was he so fat and sleek?
What kind of temper had he? How do you know?
What would a rancher call such a pony? (Cow-pony.)
Why did the stranger want him?
How did Don like his new home and companions?
What new trick did he learn?
What did his new master think of this?
What new work did he teach Don?
How did he use him?
What was Don now called? (Polo-pony.)

Seatwork:

Tell why Don was so sleek and fat, what trick he learned with his new master, and how his new master treated him.

LESSON XXXVII.

Review of Difficult Words.

Fill in the blanks with one of these words: here, hear, ant, aunt, would, wood, to, too, two, their, there.

1. I_____that you went_____see your_____Mary yesterday.
2. The_____boys saw the_____hill.
3. The man_____not come_____see the_____on the ground.
4. Did you_____the lady saw the_____was heavy?
5. _____pieces is not enough_____for the man_____carry.

LESSON XXXVIII

PICTURE STUDY

Oral discussion:

What must be the girl's name?
Name the picture.
How old is the lamb?
How do you know Mary likes it?
How do you know the lamb likes to be on her knee?
What do you think is funny about a young lamb?
What does Mary call this one?
What does she feed it and how?
What happens when Mary runs and plays?
Where does she keep the lamb at night?
What does the lamb do when it is hungry?
What does Mary do then if she is playing?

Seatwork:

Write the verse about "Mary had a little lamb."

LESSON XXXIX

Original Story

HALLOWE'EN

Oral discussion:

Tell the story of Hallowe'en; talk about its meaning, when it comes, what special thing you do at school, what school decorations you have, what you like to do at night, what you get, how you can have lots of fun without doing any harm.

Seatwork:

Write a few sentences telling how you intend spending the evening of Hallowe'en.

LESSON XL

Add **"ing"** to the following words:

come	run	laugh
make	hop	jump
love	bob	brush
take	stop	eat
line	drop	sweep
slide	hum	read
ride	skip	leap
write	slap	show
smile	hit	cry
shine	can	walk

LITERATURE STURIES SUGGESTED FOR OCTOBER

The Reader, pages 35-60.

Special literature—The Golden Touch, page 88.

Memory—The Duel.

Stories—Merry Animal Tales.

Dramatization—Mercury and the Woodman.

Suggested questions from several selections for oral or written exercises:

A

The Golden Touch

What two things did King Midas love?

For what did he wish?

What happened when Midas got his wish?

Tell about the chair, the bed, the clothes, the leaves and flowers.

Tell what happened at his breakfast.

What two things made him very unhappy then?

After he learned his lesson, name two common things he would rather have than the Golden Touch.

What change was there in the King himself afterwards?
How did this help his people and country?
What lesson do we learn from his story?

B

Mercury and the Woodman

What kind of man was the first woodman?
Why was he so sad when he dropped his axe in the water?
Who helped him?
Why did Mercury give him the gold and silver axes first?
What dishonest thing did the second woodman try to do?
How did Mercury punish him for that?
What lesson do we learn from the story?

C

The Honey-Bee's Song

What flowers does the honey-bee like?
For what does it go to these flowers?
How long does it work?
For what is it preparing?
What lesson may we learn from the bees?

D

Weighing the Elephant

What had the elephant done for the king?
How did the king wish to show his thankfulness?
Why could the wise men not weigh the elephant?
What did the sailor do?
What did the people think of his plan?
What did the sailor do after the elephant came out of the boat?
Why did the people still laugh at him?
What did the sailor order the king's servants to do?
When did he know he had silver enough to equal the weight of the elephant?
What kind of man do you think the sailor was?

ARITHMETIC

G. G. Harman

GRADE IV

Review

There is no stage at which review of previous work is not necessary. Processes become more automatic through review and speed increases for accurate work. The multiplication tables were taught in Grade III but much of the work has been forgotten. These should all be reviewed. The following type of drill is useful:

×9
2
0
7
5
1
10
3
6
4
9
8

If this column is written upon the board, the pupils may be directed to go down or up the column, giving the answers orally. If the child has control of the facts he will complete the eleven facts in seventy seconds.

It must not be forgotten that even when the bond 9×8 and 72 seems perfectly formed, it may fail to operate when the conditions are somewhat altered, as for example in

$$\begin{array}{r} 38 \\ \times 9 \end{array}$$

To bridge this gap between ability to use the 9×8 when it appears alone and ability to use it in an example, the following type of drill is recommended:

×9	
2	
0	
7	
5	
1	
10	+5
3	
6	
4	
9	
8	

In this work the pupils call the answers, 23, 5, 68, etc., in succession. Pupils in junior Grade IV should do the column once in about 45 seconds. Throughout the year the teacher may return once in a while to such a form of drill, substituting various numbers less than 9 for the "5" given above. In a similar column drilling on the table of 6, one would give no number greater than 5 as the one to be added to each product.

It is advisable after giving drill on such a table to give several examples, such as

$$\begin{array}{r} 372 \\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 5438 \\ 9 \\ \hline \end{array}$$

using the complex bonds recently reviewed.

Carrying out the above idea, the following drill is a good preparation for division:

(a) ÷9	(b) ÷9
72	78
36	41
81	83
54	61
27	34
9	17
90	91
45	49
63	70
0	3
18	23

The approximate time for (a) is 25 seconds; that for (b) is 45 seconds.

Much time may be spent on multiplication and division drill because during the year there are many applications of these tables.

Economy in Drill

Much time is often wasted by having thirty pupils listen while one pupil is working or reciting. The experienced teacher avoids these situations. In drill upon the facts given above, all pupils may be kept thinking if they are required to record all answers in a column as the exercise is given orally. For exercise (b) on division, the teacher would call the numbers 78, 41, 83, 61, 34, 17, 91, 49, 70, 3 and 23 and each pupil would write as follows:

Q.	R.
8	6
4	5
9	2
6	7
3	7
1	8
10	1
5	4
7	7
0	3
2	5

If each pupil has a Primary Number Booklet, Grade IV, all these basic facts will receive due attention. If when using the booklet the pupil will put a check mark above each printed answer each time he is unsuccessful, he will have a complete record of the frequency of all errors.

On pages 20 and 21, March, 1930, of this magazine, may be found a discussion of common errors in short division. In the Elementary School Journal, June, 1918, pp. 770-781, another summary of common errors is given. It is summarized immediately below:

Type of Error	Frequency
1. Ignorance of multiplication tables. 8) 5856 / 8107	30%
2. Confusion of multiplication and division 3) 39 / 93	14%
3. Attempting to use dividend as a whole instead of proceeding step by step	14%
4. Wrong remainder form: 2) 13 / 6-2/ ; 2) 13 / 6-1/2	10%
5. Confusion of signs: 2÷2=4	7%
6. Carrying 2) 1350 / 620	5%
7. Confusion of addition and multiplication: 3) 6 / 3	5%
8. Confusion of dividend and divisor: 8) 498 / 212	

Scope of Tables

Multiplication tables to 12 are prescribed, therefore, teach them. Tables above 10 are seldom used and in most school systems they are not taught. Do not waste time requiring pupils to drill on multiplication or division examples using these.

Checking

Attention is frequently called to the importance of checking, yet children do not form the habit. When pupils are drilling on multiplication and division, it seems advisable to have each example checked by the reverse process, as in

7) 36240 — 5177

5177-1/7 — 7

36239

1

36240

Take advantage of these opportunities to extend the vocabulary. Use the terms divisor, dividend, quotient, product, remainder, etc.

Unit Fractions

At least three ideas are involved in the unit fraction, viz., 1/2 of a single thing,
1/2 as large
1/2 of a group.

Do not attempt to explain these different ideas to the pupils but use variety of exercises to ensure that at one time or another each idea is frequently encountered. In thinking of 1/2 of a single object, or of the applications of "1/2 as large" inaccuracy will result if care is not taken. Do not pour approximately one-half of the water from a container and proceed to refer to each part as if it were one-half. First impressions and habits of thinking are difficult to correct.

Give practice in exercises such as:

1. Find 1/2, etc., of a given length already measured.
2. Find 1/2, etc., of an undetermined distance where measuring is necessary.
3. Obtain 1/2, etc., of a string, of a strip of paper, etc. where length need not be determined.
4. Find 1/2 of a given quantity of sand by balancing on equal arms.
5. Find 1/3, etc., of a sample of sand by weighing.
6. Impress meaning of 1/4 by finding 1/4 of 20 by taking 20 pegs, etc., and placing 5 in each of four piles.

Language Training

1. The meaning of terms such as: addition, sum, difference, remainder, divisor, etc.
2. Abbreviations for terms and measures used in this and earlier grades. See sections 7, page 147; 11, page 149; 6, page 151 of the Course of Studies.
3. Teach spelling of words used in the Arithmetic of the grade whenever these are within the pupils' range.
4. Read problems orally to the class and question them carefully on content, meanings, etc. To prevent the pupils from concentrating attention upon exact quantitative results, choose problems for which they cannot obtain exact answers, e.g.,
   "I have 2-1/2 acres of potatoes. If the crop yields 125 bushels per acre, how many bushels of potatoes will I have?"
   (a) In terms of the playground, how large is the potato plot?
   (b) What does the sentence "the crop yields 125 bushels per acre" mean?
   (c) About how many bushels will there be? (Approximation.)
   (d) Should you add, subtract, multiply or divide to solve this problem?
   (e) If the line ——— represents the number of bushels of potatoes on 1 acre, draw a line to represent the number of bushels from 2-1/2 acres.

   Give similar problems without numbers and ask pupils to explain exactly what the entire problem means.

Give considerable practice in these and similar methods of problem analysis.

It is very helpful after a pupil has solved a problem for which, let us assume, the written work is

$375
7

$2625

to have him write a sentence about each number and each process: $375 is—— (explanation); 7 is—— (explanation) I multiplied because———, $2625 is the product, etc.

Give many real problems. Demand individual work by requiring each pupil to record the answer for each problem given. In this drill, give relatively easy, familiar types of problems.

When pupils are given written problem-solving, increase somewhat the difficulty of the problems. Pupils will not weary of problem-solving if there is variety of procedure and if they feel their power of attack increasing.

ART

R. W. Hedley, M.A., B.Educ. G. F. Manning, M.A.

GRADE V

EXERCISE 2

TO MAKE AND DECORATE A CONE-SHAPED LAMP SHADE

Explanation.—In making a plan for a lamp shade, two methods may be considered. One method would be mathematical, a problem in mensuration. If the diameter of the base of the cone is determined, and the length of the slant side, the other measurements may be calculated. This obviously presents considerable difficulty. The second method is to make a pattern, the proper size and shape, and from this construct the shade. This method is simple, and easily understood by a Grade V pupil.

LESSON 1

To Make the Pattern.—Take a piece of fairly tough paper such as brown wrapping paper from which to make the pattern. Cut pieces sixteen inches square for each pupil, and from this square let each draw and cut a circle of eight inch radius. Then cut along any radius of this circle. See figure 1. Slide one edge of the paper past the other until the proper cone shape for the shade is secured. Mark along the edge where one paper laps over the other. This is shown by a dotted line in figure 2. Draw a line parallel to this dotted line about one-half inch away from it. This narrow strip is the lap when the shade is pasted together. The pattern for the shade is now cut away as shown in figure 2. It should be explained that the shape of the shade is shown in figure 3. If, however, the side of the cone is not required to be so steep, then less will be cut away in figure 2. This pattern should be made by each pupil in the class, following the above directions, under the teacher's guidance.

Making the Shade.—Place the pattern on the paper from which you wish to make the shade, and cut it out. The paper should be very heavy, at least twice as heavy as ordinary construction paper, and of suitable color. A suitable opening should be cut at the centre for the lamp.

LESSON 2

To Make a Decoration for the Shade.—Since drawing birds and animals in pencil is the exercise for the previous month, one of these drawings may be selected as motif for the unit in the border for the shade. An animal or bird

To make and decorate a cone-shaped lamp or candle shade.

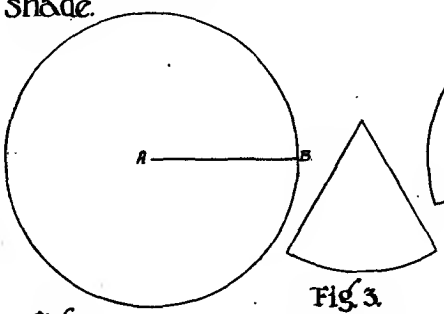


Fig. 1.

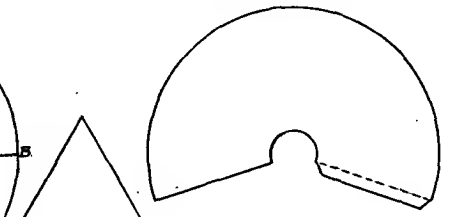


Fig. 2.

Fig. 3.

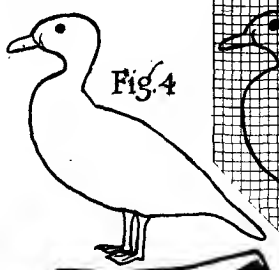


Fig. 4.

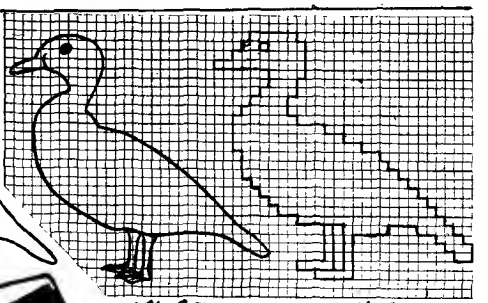


Fig. 5.

Fig. 6.

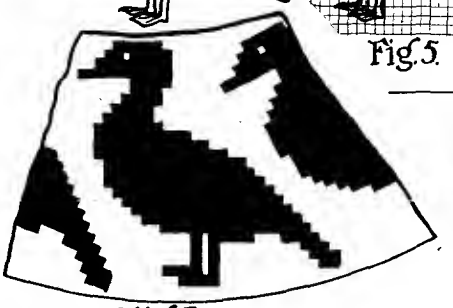


Fig. 7.

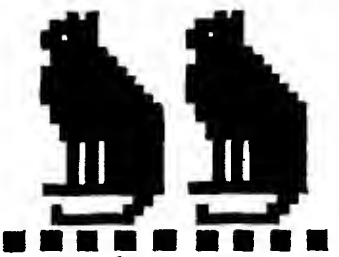


Fig. 8.

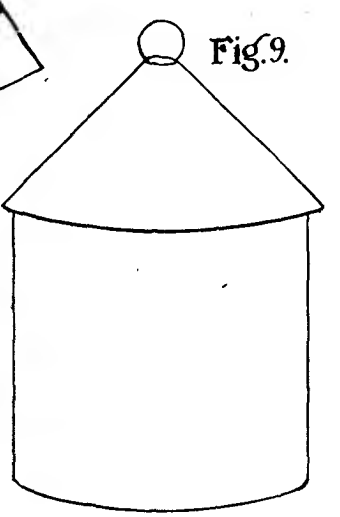


Fig. 9.

border would make an appropriate decoration. As pupils in this grade are not very familiar with the term conventionalization, or adapting a motif to design purposes, a squared animal or bird design is perhaps the simplest and easiest method to approach such a problem. To do this the animal or bird is drawn to a size that is considered suitable for the shade. This drawing is traced on cross-lined paper of one-eighth inch sections. Care should be taken to see that the squares or the one set of lines are parallel to the base line, as it were, of the drawing.

To illustrate this method an outline drawing of a duck is shown in figure 4. In figure 5, this is shown traced upon cross-lined paper. Following this outline the pupil will now mark around the sides of the nearest square as shown in figure 6. Naturally in some places a little latitude is necessary as to where the lines about the squares should be drawn. When satisfactory the squared design may be cut out, using scissors.

LESSON 3

To Make the Border on the Shade.—To space the units evenly around the shade, is the next problem. This is accomplished quite easily by taking the pattern for the shade, and folding it so that one edge coincides with the dotted line near the other. This gives two equal divisions. Continuing in this manner, you may secure four equal divisions, or eight, or even six by using a little care. Place the pattern on the shade and mark off these divisions. The squared design may now be placed in the same position in each of these divisions, and about three-quarters of an inch from the outer rim, and traced there.

Seat Work.—A shade of this type looks best if the design is cut away as shown in figure 7. This may appear somewhat tedious, but the pupil enjoys this work, which may be done at a seat-work exercise. Either a sharp knife or a pair of scissors may be used for the purpose. Sometimes it improves the border to draw and cut away a small connecting feature between the units. However, for Grade V, this may be adding an undue burden.

LESSON 4

Completing the Shade.—When the units are cut away, select tinted paper, colored engine paper will be satisfactory, and line each shade carefully. If the shade is to be used on the chimney of a kerosene lamp, the opening at the top should be made the proper size for the chimney. The outer edge may be reinforced, and wire may be placed along the inner edge next the chimney. When all is completed the shade is glued together.

Other Exercises.—In figure 9 is another type of shade

which may be made instead. In this, the decoration is placed on the cylindrical part, in a manner similar to the above. No decoration should be added to the conical part. Evidently, this shade is of the lantern type, and the light comes through the border, which should be quite wide. The cylindrical part may be fastened to the upper conical piece by cutting triangular pieces away from the upper edge of the cylinder, leaving the edge not unlike saw teeth. These may be glued to the under side of the conical part.

Square animal designs such as that shown in figure 8 are made in a similar manner to that described above. These are more compact, and might be better for a shade such as the cylindrical type.

Such an exercise as the above requires careful work throughout, and is well worth the effort.

GEOGRAPHY

J. M. Roxburgh, M.A.

GRADE VI

LESSON 5

EUROPE (Continued)

The People of Europe.—The continent is divided among a great number of nations with separate governments, and is unlike North America and Asia in this respect. Probably the broken coast-line and the fact that mountain ranges have broken the surface into smaller areas has had much to do with this. Six great races are represented.

(a) The Teutonic Peoples—The English, Germans, Dutch, Austrians, Danes, Norwegians, and Swedes are the chief of these.
(b) The Latin Races—These are the French, Spanish, Italians, Portuguese and Roumanians.
(c) The Slavs—The Russians, Polish, Czecho-Slovakians, Jugo-Slavs, and Bulgarians.
(d) The Celts—Northern Scotland, Ireland, Wales, and Brittany (a province in Northwestern France.)
(e) The Yellow Race, or Asiatics, are represented by the Turks, Hungarians or Magyars, Laplanders, the Esthonians, and Finlanders.
(f) The Greeks occupy Greece and the neighboring islands.

On an outline map of Europe on which the countries are marked, shade in color the races noted above. Mark in the names of the countries populated by each race. Keep in mind the fact that this is only an approximate grouping, as there are traces of the German race in the Slavic States, Celts in the Latin States, and so on.

THE BRITISH ISLES

Extent and Position.—They consist of two large islands, Great Britain and Ireland, together with a large number of smaller ones. The total area is about half the size of Manitoba. From Europe it is separated by the North Sea, the Strait of Dover and the English Channel. Separating the two islands are the Irish Sea, the North Channel and St. George's Channel. The islands are favorably placed among the nations of the world for trade, and the climate favors active work in all seasons of the year. Surrounded by the ocean they have been free from destructive wars with their neighbors. These are some of the reasons why the British people have been leaders in world affairs.

Climate.—Study in this connection the map on page 123. As has been previously noted, the westerly winds bring moisture from the Atlantic, and the slopes facing the west are supplied with from 40 to 90 inches of rainfall per year, while the eastern slopes of the islands average from 20 to 40 inches. Compare this with Manitoba where the rainfall is for the most part less than 20 inches.

As the British Isles are in the temperate zone they have a cool climate. It is greatly moderated by the fact that the ocean surrounds the shores. Also, the warm waters of the Gulf Stream keep the climate from being as cold as it would otherwise be. The British Isles lie between50 and 60 degrees north latitude, practically the same as Manitoba.

Study of the Surface Features.—Study a map like that on page 134 which shows the two islands at one time.

In England note the Pennine Chain extending north and south and the Cambrian mountains in Wales. On the borders between England and Scotland are the Cheviot Hills. In the south of Scotland are the Scottish Uplands, while in the north are the Highland. Between these is the Scottish Lowlands. Locate Ben Nevis, the highest mountain in Scotland, in Inverness. Study the map of Ireland and note that it has few hills, and what there are are near the coast. The central portion of the island has many lakes and bogs, and is for the most part low and level.

For purposes of agriculture the eastern side of England and part of the centre and south, is more level and therefore best adapted for this industry. In Scotland the soil is poor, yet in the Lowlands and along the east coast there are many excellent farms.

Agriculture in the British Isles.—The principal products are:

Wheat on the south-eastern part of England. Here the climate is not too moist, as it is in other parts of the islands.

Oats, barley, rye, root crops are grown wherever there is good enough soil.

Hops are grown in Kent (south of London).

Cattle are grazed in the moister areas as in Ireland and the west parts of Britain. Dairying has a market for its product in the large cities.

High grade farm animals are raised in Britain and supplied to all parts of the world. Some of the breeds are:

Horses—Clyde, Shire, Hackney, The English Thoroughbred.

Cattle—Hereford, Durham, Aberdeen-Angus, Ayrshire, Devon, Highland, Polled Angus, Jersey, Guernsey.

Sheep—Southdown, Hampshire, Suffolk, Cotswold, Lincoln, Dorset, etc.

Hogs—Berkshire, Yorkshire, Tamworth, Sussex.

The pupils should locate the countries from which these receive their name.

Sheep are raised in the hilly regions, chiefly because the land there is not suited for much else than pasture. The hilly regions of the Scottish Highland, the Southern Uplands of Scotland, the Pennines, Cumberland Hills, Dartmoor and Exmoor Hills of England, the mountain areas of Wales, are devoted to sheep-grazing. Ireland is less adapted for sheep on account of there being so much low wet land. For centuries Great Britain has been an important factor in the wool trade. In the Middle Ages wool was to England what wheat is to Western Canada, an important article of export. The weaving industry at last became established in the cities of Yorkshire, and in the Scottish Lowlands. It is from these cities, such as Leeds, Bradford, Halifax, Paisley, that the best woollen cloths are produced today. The wool used, however, is largely obtained from Australia, the product from England being entirely insufficient in quantity.

QUESTIONS AND EXERCISES

1. Complete the map showing approximately the areas occupied by the races of Europe.
2. Make a circular graph like those on page 312 in the text, comparing these as to numbers. Population of Europe, 450 millions; Slavs, 200 millions; Latins, 120 millions; Teutons, 115 millions; Celts, 3 millions; Greeks, 6 millions; Yellow race, 6 millions.
3. What is the language of the Celts in Scotland? From what race are the Latin peoples descended? Show that the English are of Teutonic origin. Which are the great Slav nations? How is the relationship of these people shown? Account for the number of small nations in Europe.
4. Why have the people of the British Isles become the leading nation of the world?
5. Sketch a map showing the main surface features of the British Isles mentioned in the lessons; also the farming and grazing areas.
6. Mark the following statements are "True" or "False":
   (a) The Gulf Stream makes the coast of the British Isles moist_____.
   (b) The Westerly winds bring warmth to them off the Atlantic_____.

(c) The nearness to the ocean helps to moderate the climate_____.
(d) The British Isles are about the same area as Manitoba_____.
(e) Rainfall is greatest on the east side of the British Isles_____.

7. Fill in the blanks: Britain is a good market for dairy products because_____. The best pastures in the British Isles are in the areas of heavy rainfall, namely _____. Wheat requires a fairly dry climate and is grown in England in_____. Other farm crops are _____. Hops are much used for_____ and are grown in_____. Famous breeds of cattle from the British Isles are_____. Sheep are raised in the hilly regions, such as_____. That Britain has done much for the development of agriculture is shown by _____.

LESSON 6

THE BRITISH ISLES (Continued)

Their Industrial Supremacy.—Up to the middle of the eighteenth century England was dependent on agriculture as her chief industry. The manufacture of textiles, that is, woven goods, was done in the homes or shops by hand. Iron was smelted with wood charcoal. Power was supplied to mills by water wheels in the rivers. About 1750 the improvements began which changed all this. Iron ore was after this smelted with the use of coke made from coal. The steam engine came into use to replace other power. Machinery was invented to spin cotton and woollen yarn; also to weave the cloth. England had the advantage over all other countries in the use of these inventions. She was the leading industrial nation, and soon changed from a farming country to a country of great factories. This change is called "The Industrial Revolution." The farms are still valuable for the purpose of supplying food for the workers in the cities, but vast supplies of food materials must be imported to supply what is required. Also the factories require the raw material, such as cotton, wool, wood, paper, silk, leather, linen, hemp, etc., with which to supply the machines, and the larger proportion of these must be brought from other countries.

England's Industries:

I. Manufacturing—textiles; iron and steel; tin, copper, zinc, lead, nickel, silver, etc.; fine china and pottery; paper; boots and shoes; soaps, jams, marmalades, pickles, sauces.

II. Ship Building and Commerce.

III. Fishing—cod, haddock, plaice, herring, etc.

IV. Agriculture — grain growing; root and forage crops; horses, cattle, sheep, hogs, poultry; hop growing; fruit growing; dairying; wool production.

V. Mining—coal, iron, copper, tin, lead, etc.

In the lessons following this we will discuss the main facts of importance in connection with these. A products map like that on page 134 should be produced by each student in simplified form.

The Textile Industry.—By this is meant the weaving of woollens, cotton, silk, linen, etc.

How England Came to Lead Other Countries:

1. She had skilled weavers available for work in the factories. England had always been famous for wool-growing.

2. European countries were disturbed by wars and revolutions.

3. The climate of England is specially suited for this industry, owing to the moist air which softens the fabric while it is being made.

4. The coast is near for cheap transportation.

5. Coal mines the convenient to supply cheap power.

6. The district surrounding Manchester on the north-east of England has been specially favored in the cotton weaving industry, owing to the moist climate, the convenience to the supply of raw cotton in America, and the fact that weavers of woollens were available and easily adapted for cotton weaving.

Centres of the Textile Industry:

Leeds, Bradford—woollens, such as worsteds, serge, tweeds.

London—imports wool, cotton, flax, etc. An important seaport.

Liverpool—a seaport for the import of raw cotton.

Manchester—manufacture of cotton goods.

Glasgow—manufacture of cottons.

Paisley (Scotland)—manufacture of thread, and woollen shawls.

Belfast (Ireland)—linen goods.

Dundee (Scotland)—jute (a coarse fibre brought from India).

ELEMENTARY SCIENCE

G. R. Rowe

GRADE VII

LESSON II

STUDY OF A TYPICAL INSECT

Grasshopper.—This is one of our commonest insects. It is found along roadsides and in grain fields. By capturing a live specimen and placing it in a glass jar, its form and movements may be observed. The body consists of three main divisions—head, thorax, and abdomen.

The head bears the antennae, eyes, and mouth parts, The antennae are the two long, threadlike, jointed structures attached to the front of the upper part of the head. These can be moved about in front of the head and are used to feel objects in the path of the insect. There are two kinds of eyes: the compound eyes are the two large, brown, glassy patches on the front and upper portion of the head. The surface of each is curved and divided into several hundred individual eyes that enable the grasshopper to see in all directions without moving the eyes or head. The simple eyes are the three bead-like structures on the front of the head between the compound eyes. The mouth parts are found on the lower portion of the head. These consist of two flaps, one at the front and the other at the back of the mouth. By raising the front flap or upper lip, two shiny, bone-like structures may be seen. These move sideways and are used to grind the food. Behind these are a pair of softer jaws used for directing the food between the biting jaws. The soft jaws and the lower lip are each equipped with a pair of jointed structures called palps, which are used for selecting the food.

The thorax or middle part of the body bears the wings and legs. It is divided into three parts. The first part bears the front pair of legs; the middle part bears the second pair of legs, and the front pair of wings; and the third part bears the third pair of legs and the hind pairs of wings.

The front and middle pairs of legs are used for walking, crawling and grasping, and the hind pair are used for jumping. Each leg consists of five parts. The two parts next the body are small and joint-like and are used to attach the leg to the body. The next two are longer and the fifth segment consists of three joints with a claw attached to the third joint. This last segment may be called the foot. Note that

the longer segments of the jumping legs in the grasshopper are heavily muscled in the case of the upper longer part and equipped with spines in the lower, longer part.

The front pair of wings are narrow solid structures. These are not used in flight but serve to protect the flying wings when the grasshopper is crawling through the grass. The hind pair of wings are transparent membranes which, when at rest, are folded under the front wings. They are variously colored in different kinds of grasshoppers.

The abdomen is the hind part of the body of the insect. It consists of a number of rings or segments that overlap one another like the parts of a telescope. Each segment consists of two parts. The bottom part is attached to the upper by a membrane. On each side of each segment is a tiny opening called a spiracle or breathing pore. These are the ends of hollow tubes that form a network within the body. By contracting the muscles of the abdomen, these tubes collapse and the air contained in them is expelled through the pores. By relaxing the muscles, fresh air is admitted. In this way the grasshopper breathes. At the end of the abdomen in female insects is the ovipositor or egg-laying apparatus. This consists of four pointed, bony structures by means of which the female digs a hole into the hard soil of paths or grassy headlands and deposits her eggs. The male grasshopper may be distinguished from the female by the fact that his abdomen terminates in a single, solid, rounded structure.

Life History of the Grasshopper.—Grasshoppers do not live through the winter. In the late summer, female grasshoppers deposit eggs in holes prepared for them in the ground. In each hole some forty to fifty eggs are laid and cemented together by a material secreted at the time of laying. In the early spring, the heat of the sun's rays hatches the eggs and the young grasshoppers appear. Even from the first the young grasshopper resembles the adult except for its small size and the absence of wings. It feeds upon the tender grass shoots in headlands or on sunny hill slopes. In a very short time its skin becomes very tight and then finally splits down the back and the young 'hopper struggles out. It now has a new soft skin which in the course of a few days becomes tight and it too breaks down the back. After about four of these moults, the wing buds begin to develop and after the fifth or sixth moult the adult grasshopper appears.

Damage Done by Grasshoppers.—How fearful the devastation of grasshoppers may be if not checked is shown by the following extract from the history of the Selkirk colony by Dr. George Bryce:

"Probably the most alarming and hopeless feature of their new colonial life was the appearance of vast flights of locusts, or grasshoppers, which devoured every blade of wheat and grass in the country. To those who have never seen the plague, it is inconceivable. The oats and barley of the colonists were in ear when suddenly the invasion came. The vast clouds of grasshoppers sailing northward came from the great Utah desert, in the United States, alighted late in the afternoon of one day and in the morning fields of grain, gardens with their promise, and every herb in the settlement were gone, and a waste, like a blasted hearth, remained behind. The sole return of their labors for the season was a few ears of half-ripened barley which the women saved and carried home in their aprons."

The Honey Bee.—This is the only insect to which we are indebted directly for anything in the nature of food. It may be seen on any summer day droning its way from flower to flower gathering nectar and pollen. The pollen grains are attached to the hairs on its body or are packed away in special sacs constructed of hairs on its hind legs. The nectar is drawn into its body where it undergoes the change that produces the honey which it deposits on its return to the hive in the cells of the honeycomb. The bee possesses wax glands which produce the wax that oozes out between the segments of the abdomen as the bee hangs suspended from the roof of the hive. The honey is used as food and the wax to make candles.

Bee Life.—Bees live in highly organized groups, known as hives. Each hive has its queen, a female bee that is specially fed and cared for. The queen bee lays the eggs for the hive. In the event of her death, another female bee is selected and developed into a queen. The other female bees are workers. They build the honey-combs, they gather the nectar and prepare the honey, they care for the young bees and the queen. The male bees are loafers. We call them "drones," because they do not work but live on the efforts of the working female bees. In times of scarcity of food the female bees frequently drive out the drones. Under these circumstances the drones starve to death.

The production of honey has grown very rapidly in Manitoba during recent years. Each year hundreds of tons of honey are produced. The keeping of bees has become an interesting and profitable branch of our agriculture.

Bees have always been kept among civilized people for the supply of honey they afford, ever since history has any record. In olden days they were more valued in this respect than they are now, on account of the fact that there was no

other supply or source of sweetening material for food, while nowadays sugar has largely taken its place as an article of diet.

Our interest in bees is principally as a study in the wonderful adaptation of this insect for certain purposes, such as getting food, living in communities, defence, etc.

We have native bees in a wild state, known as Bumble bees, which collect small quantities of honey for the feeding of their young and for carrying over winter the few individuals which remain alive after the summer's work is over. These Bumble bees make rude nests in a hollow place in the ground among the grass, sometimes making use of an abandoned mouse's nest for the purpose. Here a few cells of honeycomb are filled with the sweet nectar derived from flowers. Bumble bees may be seen at any time in warm weather visiting flowers for the nectar, and they are useful, as we have seen, to the flowers in carrying pollen-dust from flower to flower and thus helping in the production of fruit.

The Honey bee is a native of Europe and Asia and has been brought to this country by man. In its natural state, the bee gathers honey and places it in hollow trees or caves. When kept for the production of honey, bees are provided with hives and frames with comb made of wax. Where the honey is stored in cells, and as the summer draws to a close, this is taken from the hive and extracted, placed in cans and sold in the form in which it appears in the stores.

Observe the form of the bee as it appears before you in a closed glass bottle or case. It will be seen that there is a general resemblance to other insects which we have studied before, as for example the grasshopper. First notice in the

case of each of these that there are three body parts. On the first, namely the head, there are the eyes, the mouth, the antennae or feelers, and two large fixed eyes. The head is joined by a slender neck to the second of the body parts, the thorax. Here are seen attached the four wings, two on each side, and six legs. The third body division is of softer construction. It is called the abdomen. Here are located the apparatus for breathing and the outlets of the breathing pores. At the tip of this is the sting the purpose of which we all know too well.

Worker bees live only a few weeks, except in the dormant stage of winter when they live several months until the work of the following season is well under way. The queen bees live as long as three years.

The queen bees lay the eggs. From these hatch out queens, drones or workers. As soon as the hive becomes crowded, the bees "swarm," that is, the old queen leads away the young workers in a body in search of a new hive where they will make their home.

Bees pass through three stages of development. These three stages are clearly marked in the case of most insects, although not in the case of the grasshopper. The queen bee lays the eggs in the cells of comb prepared for her use by the workers. The eggs soon hatch in the warmth of the hive and there appears from each a tiny grub or larva. This is fed carefully by nurse-bees among the workers, until they grow to the full size of the cell. Then each goes through a resting stage from which it appears as a full-size bee. From the larger cells come the queen bees, the cells of which hang from the upper parts of the comb as an irregular mass. The ordinary cells for storage of honey and for the young of the workers and drones are six-sided in form. It will be found that this six-sided form is the most economical of space. You may show by a diagram that circles do not fit in well together at the angles, but hexagons do. Notice the pollen-gathering habits of bees. A number of stiff bristles on each of the legs are Nature's provision enabling the bee to collect pollen as if in a basket on its visits to the flowers.

EXAMINATION QUESTIONS

1. What are the three body parts of an insect such as the grasshopper? What are the main objects to be noticed attached to each part, or located thereon?
2. Describe the two fixed eyes of the grasshopper. How do they differ from our eyes? How far can an insect see?
3. What are the antennae for? Describe them.
4. Describe the mandibles and tell how they are used to bite off food.

5. Account for the difference in the upper and lower sets of wings. What advantage is the greenish color of the upper wings?
6. Which pair of legs is used to cling to the stems of plants? Which is most used for hopping? Explain the appearance of each. How is the power of jumping an advantage to it?
7. Tell something of the life history of the grasshopper: how the eggs are laid, and when, and where; when they hatch; growth by repeated enlargements of the outer covering; food, and enemies.
8. How are the insects injurious to the farmer? Where is most harm done by them? What are their natural enemies? What artificial means must be taken to combat them?
9. Make a careful large-scale drawing of the grasshopper, showing the parts of the body referred to in the above discussion.
10. What body parts of the bee show it to be a typical insect? Compare the number of body parts, legs, wings, eyes, with those of the grasshopper.
11. Sketch the life history of the bee. Mention the three stages in its growth, egg-laying, care taken of the young, swarming, food, honey gathering.
12. Of what value are bees to us? Of what value to flowers? Why of less value now than formerly?
13. How do Bumble bees differ from Honey bees in appearance, in homes they build?
14. How do bees gather pollen and what use is made of it? How are they able to carry the pollen to their homes?
15. Describe the honeycomb of a bee-hive. Of what is it made and what is the shape of the cells? What use is made of the cells?

LITERATURE

C. S. Edwards, B.A.

GRADES VII and VIII

THE NORMAN BARON

The Author.—Henry Wadsworth Longfellow was an American poet of the nineteenth century. He was born in Maine, was graduated from Bowdoin College, Maine, and became a professor of modern languages there. Later he had the same position at Harvard, a university in the vicinity of Boston. To prepare himself for the teaching of modern languages he travelled in France, Spain, and Italy. He also became acquainted with some of his poems. Among his poems dealing with American life are Evangeline, Miles Standish, Hiawatha, The Hanging of the Crane, Paul Revere's Ride. His European travels have provided the background for such poems as the present selection, and also King Robert of Sicily, The Bell of Atri, The Spanish Student, etc.

Longfellow is one of the most popular of the modern poets. His poems are varied in their theme, simple and easily read, and agree well with the commonplace sentiments of the masses of the English-speaking people. He had a particular reverence for deeds of devotion, and hence he is at his best in such poems as Evangeline, The Birds of Killingworth and King Robert of Sicily.

Summary of the Poem.—"The Norman Baron" may be described as an American's interpretation of a period in British history; not very accurate so far as the facts are concerned, but introducing to us nevertheless the main features of the time and drawing a pretty moral.

Synopsis of the Poem. — A Norman baron lay on his deathbed. His father had been one of those who had come over with the Conqueror, and had received as his reward lands taken from the conquered English, who were reduced to the miserable condition of serfs and vassals. The Baron's rule was particularly harsh, and the only moderating influence was the intercession of the clergy.

It was Christmas time and the carols sung by the Saxon serfs who were celebrating in the hall of the castle reached the Baron's ears, and, added to the holy words of the abbot who attended him at his bedside, aroused in his feelings of regret for the harshness with which he had treated the

people on his lands. As a last act of justice before his death he set free all his serfs and vassals. A signed paper to this effect was recorded in the priest's missal, and the story has come down through the ages as a touching example of the effect of the Christmas spirit.

Divisions of the Poem.—For purposes of study we may divide the poem into three parts as follows:

(a) The Scene in the Castle—stanzas 1 to 5.
(b) How the Baron was affected—stanzas 6 to 14.
(c) The story as it has come to us—stanzas 15 and 16.

I. **The Scene.**—The Norman Baron lay dying in a room in his castle. A storm raged without. By the death bed sat a monk repeating the prayers. The bells of the Christmas time rang in the churches. The minstrels sang Christmas songs in the hall of the castle.

"Turret" means one of the numerous small towers of the castle. "Death the gainer" means that death was winning. "Vassals" are those who served the baron. "Doomsday Book" was a famous book of William the Conqueror's time in which the property of all land-holders was recorded. "Missal" is the prayer book. "Waits" are street singers. "Kloster" is the German word for cloister or convent. "Nativity" means the birth of Christ.

1. Make a list of all the words in this section that refer to objects, customs, and people of the Norman times, as distinguished from our own.
2. A good story should tell how evil is overcome by good. What is the evil here and what are the good influences?
3. What Christmas customs are referred to here?

II. **The Baron's Repentance.**—The gleemen sang so loudly that the storm was forgotten, and the sound of the singing reached the ears of the dying baron. His eyes also rested on the pictures of the saints painted on the windows. He saw the injustice of his rule and he signed a deed giving freedom to all those who were his serfs or vassals.

"Wassail" means celebrating. "Kingly Stranger" is Christ. "Casement" is a window opening on hinges. "Miserere Domine" is Latin for "Have pity on me, O Lord". "Contrition" is regret.

1. What was the position of Saxons under Norman rule?
2. What was the theme of the songs? (Refer to stanza 9).
3. What behavior of the weather seems to have affected the baron? Is this in agreement with the Christmas time?
4. What false things are swept away by the approach of death? (Stanzas 11 and 12).
5. Describe the last act of justice done by the baron.

III. **Conclusion.**—The convent where the baron is buried is in ruins, and the crumbled stone is trodden under foot, but the good deed remains a pleasing story which has come down to us through the centuries.

1. Calculate the number of centries since that time, taking the time of the story to be about the year 1100.
2. Quote the expression from the Bible commencing "Where moth and rust . . . ."
3. Explain the rhyme scheme of the poem. Note that two stnzas must be taken together to complete the rhyme.
4. Explain why this poem gives us pleasure. Is it the picture of the romantic past, or the sympathy it calls for the oppressed, or the effect of the religious spirit at Christmas?
5. It may be doubted whether the position of the serfs and vassals was as unfortunate as might be inferred from the poem. Under the feudal system there was protection for the poor, and their condition was not that of slaves; and if they were set free in the disturbed condition of society at that time their condition might be more unfortunate than before.

RAIN IN SUMMER

Author.—Henry Wadsworth Longfellow. See note in the previous lesson.

Summary.—The poet welcomes the rain as it comes down in torrents on the streets and houses. It is welcomed by the sick man, by the children coming from school, by the working animals on the farm, by the farmer who sees in it profit for himself. The poet sees in it one of the wonders of nature, and his imagination pictures the Water-man, Aquarius, scattering the rain-drops; then they can be seen soaking down into the earth to become springs from which grow the lakes and rivers. Also they are the source of the seven-colored rainbow. Thus the changes in the Universe are seen as being each a part of a great wheel or cycle, which we call Time.

Divisions of the Poem.—These are clearly marked and the pupils should be asked to point them out for themselves and give in their own words the topics of each.

I. **The Beautiful Rain.**—In spite of the fact that to the eye and ear there is much that might be called ugly in connection with a heavy downpour, yet it is so welcome that we agree to call it beautiful. We may suppose the poet to be sitting by his window. He views the falling rain on the street and in the lane. He hears the roar of the storm on

the roof like the tramping of horses. He sees the eave-troughs spouting, and the open drain filled with muddy water.

1. "Clatters like the tramp of hoofs" is a figure of speech known as a simile, that is, a comparison using the words "like" or "as". Find another simile in this section.
2. Another figure of speech frequently met with is the Metaphor, which is a comparison made without "like" or "as". An example is "fiery", which means "like fire". All metaphors may be expanded into similes. Expand the metaphors in "breath" (line 19), "fields of air" (line 64), "bridge" (line 81), "river of Time" (line 96).
3. Find examples where the poet speaks of lifeless things as if they were things living, or parts of living things, as in "struggles out" (line 8), "throat of the overflowing spout" (line 9). These are called "Personification".

II. **The Gratitude of all Living Things** (lines 16-59).

1. Show the manner in which each expresses its pleasure—the sick man, the boys, the plain, the oxen, the farmer.
2. Point out the figure of speech in line 34.
3. Point out the lines in the poem that end in "rain". What is the effect of these lines on the mind?
4. Compare the thanks of the oxen and the farmer. Comment on this.

III. **The Poet's Thoughts on the Rain** (line 60 to the end).—Aquarius was the Waterman in Greek mythology. Pupils will find him pictured in the almanacs as one of the twelve groups of stars through which the sun must pass in the course of the year. Paraphrased, the meaning of the last three sections of the poem may be stated as follows: (1) The poet sees more deeply the significance of the rain than any of the foregoing. His mind goes back to the ancient conception of Aquarius as scattering the raindrops as a sower scatters the grain, but his fields are "fenceless",

and his shroud from which he brings out the raindrops is the clouds. (2) His mind follows the water in its course through the soil, into the springs, the lakes and rivers, and the mysterious rainbow with its seven colors, which is always seen when the sun is low. (3) The world to the thinking man is a cycle of change turning in the rapid "river of Time."

1. Name the seven colors of the rainbow.
2. How does the poet picture Aquarius?
3. What can the Seer behold that the others cannot?
4. What are some of the things he mentions in the "rounds of change"?
5. Explain the figure of speech, line 94.
6. What pleases you most in reading this poem again? Do you like the irregular stanza form? Do you like the last section as well as the first? What part seems to you too commonplace for poetry, if any? What part seems to be most poetic? How many different pictures are painted in words by the poet? Tell what they are. We can name seven.

COLUMBUS

The Author.—Joaquin Miller was an American poet who spent much of his life in the mining regions of the Western States. He is known as "The Poet of the Sierras."

Notes on the Poem.—Its theme is the dauntless spirit of the great discoverer, and the significance of the event of the discovery of America.

The poem is remarkable for its dramatic power. This is partly due to the short abrupt statements, with many examples of vivid description, and partly to the fact that much is left to the reader to fill in.

Synopsis of the Poem.—Columbus's difficulties began when his fleet was setting out from the Azores into the broad Atlantic. The mate of his ship pleaded with him to give orders to return, saying that the stars seemed to be sunken out of sight, and the men were becoming mutinous, but Columbus gave orders to continue the voyage. Twice more the mate pleaded with him, but his command was to sail on. As the days went by Columbus himself became anxious. On the last night of the voyage he remained on deck looking expectantly through the darkness for the signs of land. At last they saw the light of someone on shore. The poet says the light has grown in the centuries that follow, and has become a starlit flag. No doubt the Stars and Stripes is meant. And the motto of the nation should be the courageous words of Columbus, "Sail on!"

Detailed Study of the Poem:

Stanza I.—Azores are islands nine hundred miles off the west coast of Portugal. This is about one-fifth of the distance across the Atlantic, and if Columbus had gone straight west he would have landed in what is now Virginia. The Gates of Hercules are the cliffs on each side of the Strait of Gibraltar, or, according to some, the islands west of this. The "mate" is the person second in command. "The very stars are gone" would signify that the clouded sky at night alarmed the sailors, who imagined the stars were really not present in the sky in that region.

Stanza II.—"Mutinous" means rebellious. "Stout mate" means brave mate. "A spray of salt" a pretence that it was, but in reality it was tears. "Swarthy" means tanned.

Stanza III.—After many days sailing the mate declared that God was not there.

Stanza IV.—After some days the mate declares that the stormy seas are about to attack them as a savage animal would. This has reference to an old superstition that to the westward there was the home of a great monster who would attack any one entering that region. The white foam on the waves at night showed like the white teeth of an animal. Note the simile in the seventh line of the stanza. It is appropriate as showing the strong will of the Admiral.

Stanza V.—Columbus was the first to see the light from shore. "Time's burst of dawn" means a new and better era for the world.

GENERAL QUESTIONS

1. What prospect might have caused Columbus to give up (Stanza 1).
2. What three objections raised by the mate were mere superstitious fears?
3. Fill out the meaning intended by the mate in the seventh line of each of the first four stanzas. Also fill in the necessary words in the second and third lines of the last stanza.
4. Where does the poet use a repeated expression for greater force. (Mention a case in each stanza).
5. Where is the climax of the story? Show that much is left out by way of introduction. Show also that the close of the story leaves out much. Would the poem have been improved by lengthening in this way?
7. Draw a contrast between the mate and the Admiral.

FIRE AND DARKNESS

This is a shortening, for junior students, of "The Last Days of Pompeii", a novel by an Englishman of the Victorian era, Sir Edward Bulwer-Lytton. The scene is laid in the city of Pompeii, a fashionable city near Naples. The city was destroyed by an eruption of Vesuvius in the year 79 A.D. A description of the eruption is given in the story based on the writings of the Younger Pliny, a letter-writer of that period, whose uncle, the Elder Pliny, was killed in the disaster.

Some explanation of this kind should precede the study of the book. It should also be pointed out that the author of the novel has evidently studied the writings of the great literary men of that time in Rome, and he gives us what may be considered a very good picture of the manners and customs of the Romans, especially of the upper classes. Pupils will be asked to give some attention to this as they read the story, and not merely be carried away by the excitement of the narrative. The book should be read through once by each pupil as a home exercise, before the study is commenced in the class. The House of Pansa, the House of Salliest and the Villa of Diomed are famous sights in the ruins of Pompeii, and therefore the novel is partly historical.

Chapter I.—Our story begins with the preparations being made for a Roman feast in Pompeii. It is in the villa of a rich merchant, Diomed, who desires above all things to be friends with people of importance. As the chapter is read the pupils should refer to the list of characters, page 4, in order to keep them clearly in mind. "Circus" (page 1) here means a circular race-course. "Galleys" are ships propelled by oars. "Epicurean" means one who loves pleasure. "The number of the Muses" was nine (page 6). "Sesterce" (page 7) is the equivalent of five cents. "A Melian crane" is one from Metis, in the swamps near the Po. "The fires of Phlegethon" a fabled river of fire in Hades. "A stone from

Etna," the volcano in Sicily. "Coena", dinner, or the main meal of the day. "Roman plagiarism", the imitation of everything Grecian in Rome. Epicurus did not teach that eating and drinking were the main aims of life, but his followers in Rome took that as his meaning. "Muraena" is a sea-fish. "Falernian" is a kind of highly esteemed wine. "Corinthian" means aristocrat (page 10). "Scythian" means barbarian, or native of the north shore of the Black Sea. "The fate of Pentheus", a king of Thebes torn to pieces because he forbade the feasts of Bacchus. "Him who denies Bacchus", him who will not drink wine.

1. Locate Pompeii. Explain the statement that "it was a miniature of that age."
2. Describe the scene in the kitchen (page 7.) Mention four kinds of food we would think strange.
3. What do we learn of the character of Diomed in this scene?

Chapter II.—Here we have described a Roman villa as distinguished from a mansion. The latter had as its chief room the "atrium", whereas the villa had a peristyle, which was a roof supported with pillars in the centre of which was the "impluvium" or open court where the rain drained toward a pool. We should note the tablinum, the banqueting hall, the portico and the wardrobe. The actual house of Diomed is one of the sights of the ruined city of Pompeii.

"Coup d'oeil" means a view at a glance (page 12).

1. Attempt a drawing of the ground-plan of the villa, or copy one from an encyclopedia.
2. Mention the chief persons mentioned in the chapter and say briefly who they are.
3. How were the guests mentioned? (page 13). How did Romans seek to please those whom they addressed?
4. How can you see the beginnings of the plot here in the tiger, and the jealousy of Julia towards Ione?
5. Give an account of the "specimen of tiresome braggadacio".

Chapter III.—What is "nomenclator"? What were the posts of honor at the feast? On what basis were the guests grouped? What is a "libation"? Who was appointed director of the feast? What entertainment was provided? Who filled the cups with wine? What are amphora? (flagons or pitchers).

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